

REMARKS

Summary of the Office Action

Claims 17-31 are pending in the instant application.

Claims 18, 23 and 24 have been rejected under 35 U.S.C. § 112 as being indefinite. Claims 17-31 also have been rejected under 35 U.S.C. § 103(a) as being obvious from Parodi et al. U.S. Patent No. 5,651, 823 ("Parodi") in view of Yonemizu et al. U.S. Patent No. 5,958,145 ("Yonemizu").

The Examiner also has objected to the drawings as not showing features of claims 17, 22-24 and 27-29.

Applicant's Reply

Applicant has amended claim 17, 18, 23, and 24 for clarity. Applicant respectfully traverses the objection to the drawings, the prior art rejections, and the indefiniteness rejections.

Objections to the Drawings

With respect to the elements of claim 17, applicant respectfully submits that all of the claimed elements are properly shown in FIGS. 1 and 2. In particular, the external handing device 2 is shown having grippers 13.

With respect to claims 22 - 24, which refer to multiple heating and cooling plate stacks, FIGS. 1 and 2 are readily understood as showing the first plate (8) of a vertical stack of heating plates and the first plate (7) of a vertical stack of cooling plates. Similarly, with respect to claims 27 - 29, which refer multiple chambers and handling devices, FIGS. 1 and 2 are readily understood as showing the first chamber (6) of a stack of chambers and a first pair (9, 2) of multiple internal and external handling devices. A person skilled in the art will readily

Amendments to the Drawings

Applicants have amended FIGS. 1 and 2 to indicate stacks or multiple numbers of several of the numbered elements.

Replacement drawings corresponding to FIGS. 1 and 2 are enclosed.

understand these claim elements from the specification and the FIGS. Applicant previously proposed that further amendments to the FIGS. were only likely to add clutter without significant addition to the understanding of the claimed features. However, to advance prosecution of this application, applicant has amended FIG. 1 inserting graphical text boxes, which indicate that each of the elements 2, 6, 7, 8 and 9 respectively represents the first of an N-stack or a multiple of such elements. Applicants believe such graphical text boxes are proper under 37 C.F.R. 1.83(a). Therefore, applicant respectfully requests that the objection to the drawings be withdrawn.

In case the Examiner continues to object to the amended FIGS. as not sufficiently supporting dependent claims 22 - 24 and 27 -29, applicant respectfully requests that Examiner should call the undersigned attorney by telephone to discuss advancing prosecution of this application.

§ 112 rejections

Applicants have amended claims 18, 23, and 24 so that the recited terms have proper antecedent basis. Applicant respectfully submits that the claims now are definite and conform to all requirements of § 112.

§ 103(a) rejection

Independent claim 17

Applicant's invention relates to the transfer of wafers in or out of vacuum processing chambers. Claim 17 describes an integrated apparatus for transferring wafers from a wafer-holding cassette into a wafer processing vacuum chamber and across the vacuum chamber between hot "processing" plates and cold "resting" plates. (See e.g., specification ¶ [0002]). The inventive apparatus includes an external handler and an internal handler. The external

handler transfers wafers between the cassette and the vacuum chamber. The internal handler is configured to receive transferred wafers from the external handler and to move wafers between the hot and cold plates in the vacuum chamber. In particular, the elements of claim 17 include an internal handler which is "disposed in . . . the vacuum chamber" and is configured "to interact with said grippers [of the handler external to the vacuum chamber] to receive a wafer therefrom." Further, the internal and external handlers are configured to move the wafers along "a linear axis extending from the wafer cassette through the cooling and heating plates."

As previously noted Parodi describes a cluster tool for substrate photolithography, which includes multiple processing modules (e.g., a photo resist coater (11), a developer (12), and thermal process modules (17, 18)). (See Abstract and FIG. 1). In each coater and developer module, Parodi's places a robot (13) which pivots about a fixed point and transfers substrate wafers between processing stations in the module and I/O cassettes (e.g., cassettes 19, 20), which are clustered around the robot. (See e.g., FIGS. 1 and 5A-5D). Parodi also shows a linear transfer mechanism (208) for transferring wafers between heating and cooling plates (124, 128, and 126) within thermal processing modules (heating/cooling units 17 or 18). (See e.g., FIGS. 7 and 10b). However, Parodi's process modules for photo resist coating (11), developing (12), and heating/cooling (17, 18)) all are at ambient pressures. The modules do not include vacuum chambers. In particular, Parodi does not show, teach or suggest a pair of handlers "external" and "internal" to "a vacuum chamber" as is required by applicant's claim 17. Further, Parodi does not show, teach or suggest a configuration of handlers — external and internal to a vacuum chamber, to move a wafer along a linear axis extending from an I/O cassette through a heating and cooling plate arrangement.

Further Yonemizu, like Parodi, is not concerned with the transfer of wafers in or out of vacuum processing chambers. Yonemizu describes an apparatus for washing both sides of a wafer. Yonemizu like Parodi fails to show, teach or suggest a configuration of handlers — external and internal to a vacuum chamber, which move a wafer along a linear axis extending from an I/O cassette through a heating and cooling plate arrangement in the vacuum chamber.

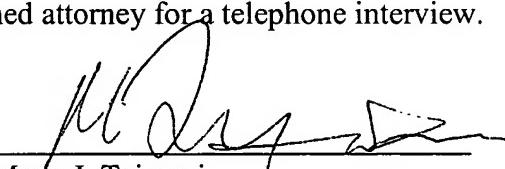
Thus, neither Parodi nor Yonemizu, whether taken individually or in combination, show, teach or suggest all of the elements of claim 17. Therefore claim 17 is patentable over Parodi and Yonemizu. Further, dependent claims 18-31 also are patentable over the cited references for at least the same reason as parent claim 17.

Conclusion

Applicant respectfully submits that this application is now in condition for allowance. Reconsideration and prompt allowance of which are requested.

If there are any remaining issues to be resolved, applicant respectfully requests that the Examiner should kindly contact the undersigned attorney for a telephone interview.

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